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FINAL REPORT  
FOR  
CONTRACT NUMBER N00014-78-C-0862

SAI-83-702-WA

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February 9, 1982



Scientific Officer  
Ocean Programs Office  
Naval Ocean Research and Development Activity  
NORDA Code 500  
NSTL Station, Mississippi 39529

Attention: Mr. Bobby Wheatley

Subject: Contract No. N00014-78-C-0862

Dear Mr. Wheatley

This letter and enclosure constitute the final report for contract N00014-78-C-0862. The final report is line item A002 in accordance with the contract.

The period of performance was from 5 September 1978 through 9 February 1982. The tasks in this contract dealt with the environmental acoustic (EVA) support of the Tactical ASW Environmental Acoustic Support (TAEAS) Program objectives in the area of TASSRAP O/B and the maintenance of specific acoustic models.

We have enclosed a DD Form 250 for completion of this contract. SAI would appreciate you noting your acceptance of this work in Block 21B, and sending to our contracts office (Attention: Janice Steinbeck) a copy of the completed form.

If you have any comments or questions please contact us.

Thank you,

*W. D. Kirby*

W. D. Kirby

cc: Distribution



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Final Report  
for  
Contract Number N00014-78-C-0862

SAI-83-702-WA

February 1982

Prepared by  
William D. Kirby  
Ocean Acoustics Division

Prepared for  
Naval Ocean Research and  
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NSTL Station, MS 39529

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Section 1  
INTRODUCTION

This document is the final report for Office of Naval Research Contract Number N00014-78-C-0862. The work under this contract was conducted during the period from 5 September 1978 through 9 February 1982. Three modifications to this contract have been awarded. The following sections address the tasks performed under this contract.

## Section 2

### ORIGINAL CONTRACT TASKS

#### 2.1 TASK STATEMENT

The original contract contained the following task statement.

"The Contractor shall provide acoustic analysis in support of the Tactical Anti-Submarine Environmental Acoustic Support (TAEAS) project. Specifically, the Contractor shall perform the following tasks:

Task I Incorporate software changes into the Towed Array Surveillance System Range Prediction on Board (TASSRAP O/B) program to eliminate most of the model/operator problems identified during the at-sea tests and incorporate minor improvements in the system.

Task II Provide planning support to the TASSRAP O/B program by participating in the planning, execution, and subsequent evaluation of a series of tests to establish the operational readiness of the system ashore prior to the deployment of the system."

#### 2.2 WORK PERFORMED

SAI assisted the Navy and its contractors in making the necessary changes to the Towed Array Surveillance

System Range Prediction on Board (TASSRAP O/B) program to insure it would meet the operational requirements. In addition, SAI assisted in the support of the planning, execution and evaluation of TASSRAP O/B.



Section 3  
MODIFICATION P0001 TASKS

3.1 TASK STATEMENT

Modification P0001 to this contract contains the following task statement.

"Under the terms of Modification P0001, the Contractor shall provide technical assistance for the Tactical ASW Environmental Acoustic Support (TAEAS) project. The Contractor shall assist NORDA Code 500 in cooperation with other Navy activities in the technical support of specific acoustic performance prediction models which are of direct concern to the TAEAS project. This shall involve investigations, analysis, and technical documentation as may be needed on a required basis. Specifically, a technical description of the SHARPS III model is required."

3.2 WORK PERFORMED

Under this contract a draft of the technical description of SHARPS III has been prepared, and it is under revision to reflect more recent changes to the model.

Specific analysis performed under this contract have been reported in the form of informal file memoranda. One formal report is as follows.

"SHARPS III Predictions of Echo and Reverberation Levels Compared to Those from NISSM II (U)", William D. Kirby, SAI-80-288-WA, July 1979, CONFIDENTIAL, (AD-C019 454L)

Section 4  
MODIFICATION P0002 Tasks

4.1            TASK STATEMENT

Modification P0002 to this contract contains the following task statement.

"Under the terms of Modification P0002, the Contractor shall assist NORDA in cooperation with other Navy activities and contractors in the technical support of specific acoustic performance prediction models which are of direct concern to the TAEAS project. The specific models are ASRAP, VLAD, Active ASRAP, and SHARPS III. This will involve investigations, analysis and technical documentation as may be needed on an as required basis."

4.2            WORK PERFORMED

Specific analysis performed under this task have been reported in the form of informal file memoranda. A major emphasis of this work has been the analysis of specific prediction problems at Fleet Numerical Oceanography Center, Monterey, California. This has included specific assistance in integrating the VLAD performance prediction capabilities into the operational FNOC system.

Section 5  
MODIFICATION P0003 TASKS

5.1            TASK STATEMENT

Modification P0003 to this contract contains the following task statement.

"Under the terms of Modification P0003, the Contractor shall perform the following tasks: Assist NORDA Code 500, in cooperation with other Navy activities and contractors, in the technical support of specific acoustic performance prediction models at Fleet Numerical Oceanography Center (FNOC) which are of direct concern to the TAEAS project. These models include ASRAP, VLAD, Active ASRAP and SHARPS III. This effort will involve various investigations, analyses, and technical documentation as may be needed on an as required basis."

5.2            WORK PERFORMED

Specific analysis performed under this task have been reported in the form of informal memoranda and formal reports. Two formal reports have been prepared, and one of these is still under review and comment. These two reports are as follows:

1. "Investigation of SHARPS III Using Multilayer Canonical Volume Scattering Strength Profiles", W. D. Kirby, R. Holt, SAI-82-509-WA, June 1981, UNCLASSIFIED, (AD-B059-396L)

2. "Gradient Dependent AMOS Equations", W. D. Kirby, SAI-82-566-WA, August 1981, UNCLASSIFIED, (Draft)

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REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER SAI-83-702-WA	2. GOVT ACCESSION NO. AD-A111 070	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Final Report for Contract Number N00014-78-C-0862		5. TYPE OF REPORT & PERIOD COVERED Final Report 5 Sept 1978 - 9 Feb 1982
		6. PERFORMING ORG. REPORT NUMBER SAI-83-702-WA
7. AUTHOR(s) William D. Kirby		8. CONTRACT OR GRANT NUMBER(s) M00014-78-C-0862
9. PERFORMING ORGANIZATION NAME AND ADDRESS Science Applications, Incorporated 1710 Goodridge Dr. McLean, VA 22102		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS PE-63795N Project R0120
11. CONTROLLING OFFICE NAME AND ADDRESS Naval Ocean Research and Development Activity NSTL Station, Mississippi 39529		12. REPORT DATE February 1982
		13. NUMBER OF PAGES 9
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		15. SECURITY CLASS. (of this report) UNCLASSIFIED
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report)  Unlimited		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)  Unlimited		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number)  Underwater Acoustics, numerical modeling		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number)  The tasks in this contract dealt with the environmental acoustic (EVA) support of the Tactical ASW Environmental Acoustic Support (TAEAS) program objectives in the area of TASSRAP O/B and the maintenance of other specific underwater acoustic numerical models.		

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**Subj: DECLASSIFICATION OF LONG RANGE ACOUSTIC PROPAGATION PROJECT (LRAPP) DOCUMENTS**

**Ref: (a) SECNAVINST 5510.36**

**Encl: (1) List of DECLASSIFIED LRAPP Documents**

1. In accordance with reference (a), a declassification review has been conducted on a number of classified LRAPP documents.
2. The LRAPP documents listed in enclosure (1) have been downgraded to UNCLASSIFIED and have been approved for public release. These documents should be remarked as follows:

Classification changed to UNCLASSIFIED by authority of the Chief of Naval Operations (N772) letter N772A/6U875630, 20 January 2006.

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3. Questions may be directed to the undersigned on (703) 696-4619, DSN 426-4619.

A handwritten signature in black ink, appearing to read "B. F. Link", is positioned above the typed name.

BRIAN LINK  
By direction

Subj: DECLASSIFICATION OF LONG RANGE ACOUSTIC PROPAGATION PROJECT  
(LRAPP) DOCUMENTS

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NAVAIR  
NUWC  
SAIC



# Declassified LRAPP Documents

Report Number	Personal Author	Title	Publication Source (Originator)	Pub. Date	Current Availability	Class.
NORDA35VOL.1BK 2OF3	Lauer, R.B.	THE ACOUSTIC MODEL EVALUATION COMMITTEE (AMEC) REPORTS, VOL. 2- APPENDICES A-D- EVALUATION OF THE FACT PL9D TRANSMISSION LOSS MODEL	Naval Ocean R&D Activity	810901	ND <i>ADC 034019</i>	U
NORDA36VOL.3BK 2OF3	Lauer, R.B., et al.	THE ACOUSTIC MODEL EVALUATION COMMITTEE (AMEC) REPORTS, VOL. 3- APPENDICES A-D- EVALUATION OF THE RAYMODE X PROPAGATION LOSS MODEL (U)	Naval Ocean R&D Activity	810901	ND <i>ADC 034022</i>	U
Unavailable	Hooper, M. W., et al.	MEASUREMENTS AND ANALYSIS OF ACOUSTIC BOTTOM INTERACTION IN THE NORTHWESTERN MEXICAN BASIN	University of Texas, Applied Research Laboratories	811005	ADA107551	U
Unavailable	Kirby, W. D.	FINAL REPORT FOR CONTRACT NUMBER N00014-78-C-0862	Science Applications Inc.	820201	ADA111000	U
Unavailable	Brunson, B. A., et al.	PHYSICAL SEDIMENT MODEL FOR THE PREDICTION OF SEAFLOOR GEOACOUSTIC PROPERTIES	Planning Systems Inc.	820701	ADA119445	U
Unavailable	Cavanagh, R. C., et al.	NORDA PARABOLIC EQUATION WORKSHOP, 31 MARCH - 3 APRIL 1981	Naval Ocean R&D Activity	820901	ADA121932	U
NORDA34VOL.1A	Martin, R. L., et al.	THE ACOUSTIC MODEL EVALUATION COMMITTEE (AMEC) REPORTS, VOL. 1A- SUMMARY OF RANGE INDEPENDENT ENVIRONMENT ACOUSTIC PROPAGATION DATA SETS	Naval Ocean R&D Activity	820901	ADC034017; ND	U
Unavailable	Bartberger, C. L., et al.	THE ACOUSTIC MODEL EVALUATION COMMITTEE (AMEC) REPORTS, VOLUME 2. THE EVALUATION OF THE ACOUSTIC MODEL EVALUATION COMMITTEE	Naval Ocean R&D Activity	820901	ADC034019	U
Unavailable	Deavenport, R., et al.	(AMEC) REPORTS, VOLUME 3. EVALUATION OF THE RAYMODE X PROPAGATION LOSS MODEL. BOOK 2. APPENDICES A-D	Naval Ocean R&D Activity	820901	ADC034022	U
Unavailable	Unavailable	1975-1982 SUMMARY REPORT	Analysis and Technology, Inc.	821217	ADA192591	U
Unavailable	DeChico, D.	ACOUSTIC EVALUATION OF SANDERS ASSOCIATES ACODAC SENSORS	Naval Air Development Center	830301	ADB073873	U
NRL-FR-8695; NRL-8695	Palmer, L. B., et al.	TRANSVERSE HORIZONTAL COHERENCE AND LOW-FREQUENCY ARRAY GAIN LIMITS IN THE DEEP OCEAN	Naval Research Laboratory	830809	ND	U
Unavailable	Unavailable	ENGINEERING SUPPORT FOR ACOUSTIC AND ANALYSIS SYSTEM	Systems Integrated	840101	ADB091112	U
Unavailable	Unavailable	SEAS (SURVEILLANCE ENVIRONMENTAL ACOUSTIC SUPPORT PROGRAM) SUPPORT	Systems Integrated	840229	ADB091119	U